

REMARKS

The Final Office Action dated August 18, 2004, has been received and reviewed.

Claims 1-60 are currently pending and under consideration in the above-referenced application, each standing rejected.

Reconsideration of the above-referenced application is respectfully requested.

Rejections Under 35 U.S.C. § 102

Claims 21, 23, 32, 33, 36-38, 41, and 49-54 stand rejected under 35 U.S.C. § 102.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Pramanik

Claims 21, 23, 32, 33, and 36-38 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is purportedly anticipated by the disclosure of U.S. Patent 5,852,497 to Pramanik et al. (hereinafter “Pramanik”).

Pramanik describes a process for locating or identifying conventional alignment marks on a substrate. Col. 1, lines 63-65; col. 10, lines 36-39. The alignment marks that are identified in the process of Pramanik comprise shallow trench isolation (STI) structures that are covered by one or more layers of opaque material. Col. 2, lines 60-63. The process of Pramanik is effected once the substrate has been brought to a desired destination—a photolithography apparatus in which photoresist is selectively exposed to radiation. See col. 4, lines 10-26. When the substrate is at the desired destination and the positions of the alignment marks have been identified, one or both of the substrate and a reticle may be oriented in such a way that moved to align the substrate and the reticle with one another. Col. 3, line 45; see also col. 1, lines 27-30.

Independent claim 21 recites a method for determining a destination of a semiconductor device substrate. That method includes identifying a mark that comprises at least one recess

within a surface of the semiconductor device substrate, which mark is covered with at least one layer of material. Such identification includes scanning electromagnetic radiation over a plurality of locations of the substrate, detecting locations at which an intensity of the electromagnetic radiation changes from substantially a baseline intensity, and correlating each such location to identify the mark. Once the mark has been identified, a predetermined destination for the substrate may also be identified.

As noted above, Pramanik does not evaluate the STI structures for the purpose of determining the next destination for a wafer or other semiconductor device structure. Rather, the wafer is already at the desired destination when the STI structures are located. The wafer is then finely aligned so that a mask may be accurately and precisely positioned over the wafer.

See col. 1, lines 27-30.

Thus, Pramanik includes no express or inherent description of identifying a predetermined destination for a semiconductor device substrate based on an identity of a mark. Stated another way, the STI structures that may be viewed in accordance with the subject matter disclosed in Pramanik are not used to identify a destination for a wafer or other semiconductor device structure.

Therefore, Pramanik does not anticipate each and every element of independent claim 21. It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(b), independent claim 21 is allowable over Pramanik.

Each of claims 23, 32, 33, and 36-38 is allowable, among other reasons, as depending either directly or indirectly from claim 21, which is allowable.

Noguchi

Claims 41 and 49-54 stand rejected under 35 U.S.C. § 102(b) for being drawn to subject matter which is assertedly anticipated by the subject matter disclosed in U.S. Patent 5,361,150 to Noguchi (hereinafter “Noguchi”).

Noguchi describes liquid crystal displays (LCDs) with identification marks. The identification mark of an LCD according to Noguchi includes a character pad 13 that is formed in or from an opaque thin film 7. Col. 4, lines 10-20. Noguchi clearly indicates that “no opaque

thin film is laminated on the character pad 13" (col. 4, lines 51-54), with the possible exception of a reflective lower metal film 17, which apparently facilitates unimpeded, direct viewing (from location 12 of FIG. 6) through a transparent glass substrate 1 over which the character pad 13 is formed (*see* col. 4, lines 59-64). Instead of an opaque material, only transparent films (lower and upper insulating films 8 and 11) are laminated over the character pad 13. Col. 4, lines 54-64. Noguchi requires that these transparent films have a light transmission factor of at least 90% for wavelengths of electromagnetic radiation that are in the visible wavelength range (starting at about 350 nm) and higher (*i.e.*, according to Noguchi, the opacity of the film does not increase for higher wavelengths). Col. 5, lines 16-18. By ensuring that the character pad 13 is covered only with transparent materials, the identification mark formed thereby "can be visually viewed by a human being and by sensor devices." Col. 5, lines 9-12.

Independent claim 41 is drawn to a system for identifying a marking on a substrate indicative of a type of semiconductor device being fabricated on the substrate and at least partially covered by at least one layer of material. The system of independent claim 41 includes, among other things, at least one radiation source configured and positioned to direct electromagnetic radiation of at least one wavelength toward a substrate, the at least one wavelength capable of at least partially penetrating a material that is substantially opaque to at least some wavelengths of electromagnetic radiation. In addition, the system of independent claim 41 includes at least one reflectometer positioned so as to receive electromagnetic radiation of the at least one wavelength reflected from a location of the substrate covered with the material that is substantially opaque to at least some wavelengths of electromagnetic radiation.

Noguchi lacks any express description of a sensor device that includes a radiation source which is configured and positioned to direct, toward a substrate, electromagnetic radiation of at least one wavelength capable of at least partially penetrating a material that is substantially opaque to at least some wavelengths of electromagnetic radiation.

As the character pad 13 of Noguchi may be "visually viewed by a human being and by sensor devices" (col. 5, lines 9-12), any sensor devices that are used to detect a marking formed by the character pad 13 need not include a radiation source configured and positioned to direct, toward a substrate, electromagnetic radiation of at least one wavelength capable of at least

partially penetrating a material that is substantially opaque to at least some wavelengths of electromagnetic radiation. Therefore, Noguchi also lacks any inherent description of a system with a radiation source configured and positioned to direct, toward a substrate, electromagnetic radiation of at least one wavelength “capable of at least partially penetrating a material substantially opaque to at least some wavelengths of electromagnetic radiation . . .”

As the disclosure provided by Noguchi does not expressly or inherently describe each and every element of independent claim 41, it is respectfully submitted that Noguchi does not anticipate each and every element of independent claim 41, as would be required to maintain the 35 U.S.C. § 102(b) rejection of independent claim 41.

Each of claims 49-54 is allowable, among other reasons, for depending either directly or indirectly from claim 41, which is allowable.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 102(b) rejections of claims 21, 23, 32, 33, 36-38, 41, 49-54 be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-20, 22, 24-31, 34, 35, 39, 40, 42- 48, and 55-60 have been rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Pramanik in View of Noguchi

Claims 1-3 and 6-18 stand rejected under 35 U.S.C. § 103(a) for being directed to subject matter which is allegedly unpatentable over teachings from Pramanik, in view of the subject matter taught in Noguchi.

It is respectfully submitted that there is at least one reason that a *prima facie* case of obviousness has not been established against any of claims 1-3 and 6-18. In particular, it is respectfully submitted that one of ordinary skill in the art would not have been motivated to combine the teachings of Pramanik and Noguchi in the manner that has been asserted. Specifically, Noguchi teaches away from the subject matter taught in Pramanik, as well as that recited in claims 1-3 and 6-18. While the teachings of Pramanik and claims 1-3 and 6-18 are directed to techniques which include visualizing features (Pramanik) or characters (claims 1-3 and 6-18) through at least one layer of material which is opaque to at least some wavelengths of electromagnetic radiation, Noguchi clearly teaches limiting the layers that cover a marking to visibly transparent materials so that the markings can be visually detected. Col. 4, line 48, to col. 5, line 12.

Since Noguchi teaches away from the asserted combination, as well as from the subject matter recited in claims 1-3 and 6-18, it is apparent that the only way one of ordinary skill in the art would have been motivated to combine the teachings of Pramanik and Noguchi would have been through improper hindsight provided by the disclosure and claims of the above-referenced application.

Therefore, it is respectfully submitted that a *prima facie* case of obviousness has not been established against any of claims 1-3 or 6-18. Accordingly, it is respectfully submitted that, under 35 U.S.C. § 103(a), each of these claims recites subject matter which allowable over the teachings of Pramanik and Noguchi.

Pramanik et in View of Noguchi and Bareket

Claims 4, 5, 19, 20, 24, 25, 39, and 40 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over the subject matter taught in

Pramanik, in view of teachings from Noguchi and, further, in view of the teachings of U.S. Patent 5,889,593 to Bareket (hereinafter "Bareket").

Bareket teaches an optical system and methods. The optical system of Bareket includes an angle-dependent reflectometer with multiple detection elements for detecting radiation which is reflected at different angles. In addition, that system includes a processing system that acquires and analyzes data of the detected, reflected radiation. The system of Bareket is useful for optically inspecting semiconductor wafers, including the widths of conductive lines (or "periodic text patterns") on the surfaces of the semiconductor wafers.

Each of claims 4, 5, 19, 20, 24, 25, 39, and 40 is allowable since Bareket does not remedy the fact that Noguchi teaches away from the combination thereof with Pramanik, as well as from the subject matter recited in claims 4, 5, 19, 20, 24, 25, 39, and 40.

Claims 4, 5, 19, and 20 are also allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

Each of claims 24, 25, 39, and 40 is also allowable, among other reasons, for depending either directly or indirectly from claim 21, which is allowable.

Noguchi in View of Duncan

Claims 42-48 and 55-58 are rejected under 35 U.S.C. § 103(a) for being directed to subject matter which is purportedly unpatentable over teachings from Noguchi, in view of the subject matter taught in U.S. Patent 4,585,931 to Duncan et al. (hereinafter "Duncan").

Each of claims 42-48 and 55-58 is allowable, among other reasons, for depending either directly or indirectly from claim 41, which is allowable.

Bareket in View of Noguchi

Claims 59 and 60 have both been rejected under 35 U.S.C. § 103(a) for reciting subject matter which is allegedly unpatentable over teachings from Bareket, in view of the subject matter taught in Noguchi.

Independent claim 59 is directed to a processor for characterizing at least one material-covered recessed marking formed in a substrate and a type of semiconductor device being

fabricated on the substrate. The processor of independent claim 59 includes at least one logic circuit for comparing a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from a planar portion of the substrate, as well as at least one logic circuit for mapping a plurality of locations of said substrate where said measured intensity differs from said baseline intensity. The resulting map comprises a digital image of the recessed marking. The processor of independent claim 59 also includes at least one logic circuit for identifying a type of semiconductor device that corresponds to the mapped locations.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against amended independent claim 59 for at least two reasons.

First, it is respectfully submitted that neither Bareket nor Noguchi teaches or suggests a processor which is configured to compare a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from “a planar portion of the substrate” and, based upon such comparison, to map locations where the baseline intensity and the measured intensity differ from one another. Instead, the teachings of both Bareket and Noguchi are limited to conventional optical recognition systems, in which it is not necessary to use a “planar portion of [a] substrate” as a reference point.

Second, since neither Bareket nor Noguchi teaches or suggests a logic circuit which is configured to map a plurality of locations on a substrate where a measured intensity differs from a baseline intensity at a planar region of a substrate to generate a digital image of a recessed marking formed in the substrate, neither of these references could motivate one of ordinary skill in the art to develop a processor with such a logic circuit.

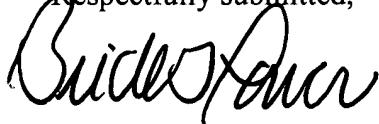
Therefore, it is respectfully submitted that, under 35 U.S.C. § 103(a), amended independent claim 59 is allowable over the combination of Bareket and Noguchi.

Claim 60 is allowable, among other reasons, for depending from claim 59, which is allowable.

CONCLUSION

It is respectfully submitted that each of claims 1-60 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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